

### **REMARKS**

Reconsideration and withdrawal of the rejections set forth in the Final Office Action dated April 29, 2011, is respectfully requested in view of this amendment. By this amendment, claims 1 and 4 have been amended and new claim 19 has been added. Claims 1-5, 12, 17 and 19 are pending in this application and presented for examination.

Claim 1 has been amended to describe specific components, to positively describe the tube plate and the light receiving element capable of receiving the fluorescence. Claim 1 has also been amended to describe that the optical waveguide is positioned in front of the lamp which has an open structure in cooperation with said reflective mirror.

Claim 1 has also been amended to define, in the last paragraph, an arrangement of the components. Specifically, the arrangement was described such that light will travel through optical components of the real time monitoring apparatus in the order of the lamp and said reflective mirror, followed by the optical waveguide and infra-red cutting filter, followed by the condensing lens, followed by the sample, followed by the selective transmission filter and the first focusing lens, followed by the light receiving element.

Claim 4 has been amended to describe a rectangular layout minimizing the loss of the light emitted from the light irradiation source adjusted to an aspect ratio of the reaction tube plate using the optical waveguide. Support is found in the original specification, at paragraph [0053] (as published in U.S. Published Application No. 2006-0145098).

New claim 19 corresponds to claim 1, but inverts the order, within the light path, of the optical waveguide and the selective transmission filter.

It is respectfully submitted that the above amendments introduce no new matter within the meaning of 35 U.S.C. §132.

In the Final Office Action, the Examiner rejected claims 1-5, 12, and 17 under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 1-5, 12, and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants' Admitted Prior Art in view of in view of U.S. Patent Application 2003/0002038 A1 to Mawatari (hereinafter *Mawatari*) and U.S.

Patent 4,689,797 to Olshansky (hereinafter *Olshansky*). These rejections, as applied to the revised claims, are respectfully traversed.

#### **ACKNOWLEDGEMENT OF INTERVIEW**

An interview, granted by the Examiner and held on July 13, 2011, is gratefully acknowledged. During the interview, claim 1 was discussed. The applicability of the prior art was discussed, as related to claim 1, as well as requirements to overcome the rejections under 35 U.S.C. §112, second paragraph. It was agreed that Applicants would include a description of the optical order of particular components in order to clarify the use of the optical waveguide.

The interview is believed to have expedited the prosecution of this case, and the Examiner's extra efforts in this regard are appreciated.

#### **Rejections Under 35 U.S.C. §112**

The Examiner rejected claims 1-5, 12, and 17 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Specifically, the reference to the arrangement of the components along the light path was deemed unclear.

#### **Response**

By this Response and Amendment, the rejections to claim 1 is respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

35 U.S.C. §112, second paragraph, states that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

It is respectfully submitted that amended claim 1 now particularly points out and distinctly claim the subject matter.

Claim 1 has been amended by this response to disclose the specific components and to describe the arrangement of the light source, optical tunnel, sample plate and receiving device. Hence, Applicants submit that the rejections of claims 1, and claims dependent therefrom, under 35 U.S.C. §112 are overcome.

Corresponding recitations in new claim 19 are similarly believed to be in compliance with 35 U.S.C. §112, second paragraph.

It is therefore respectively submitted that the rejection under 35 U.S.C. §112 should be withdrawn.

### **Rejections Under 35 U.S.C. §103**

The Examiner rejected claims 1-5, 12, and 17 under 35 U.S.C. §103(a) over Applicants' admitted prior art, taken in view of *Mawatari* and *Olshansky*. These rejections, as applied to the amended claims, and to newly-submitted claim 19, are respectfully traversed.

### **Response**

This rejection is traversed on the legal basis set forth in Applicants' response of November 24, 2010.

Applicants' claim 1, as amended, describes:

"... an optical waveguide positioned in front of [a] lamp which has an open structure in cooperation with said reflective mirror ... having a configuration that ... provides a uniform intensity of light ... illuminating the sample with a uniform light intensity distribution as provided by the uniform intensity of light from the optical waveguide ... reducing of the difference in light intensity between the center and the edges ... said components arranged so that light will travel through optical components of the real time monitoring apparatus in the order of the lamp and said reflective mirror, followed by the optical waveguide and infra-red cutting filter, followed by the condensing lens, followed by the sample, followed by the selective transmission filter and the first focusing lens, followed by the light receiving element."

Applicants' claim 19 includes similar recitations, but with the selective transmission filter positioned before the optical waveguide.

As indicated in the Final Office Action, *Applicants' admitted prior art* is acknowledged as not describing the light irradiation source comprising an optical waveguide. *Mawatari* is cited as teaching a photothermal spectroscopic analyzer which performs thermal lens spectrometry with a light source comprising an index guided type semiconductor laser with a waveguide (described at paragraph [0100]).

The cited description of a waveguide (*Mawatari* paragraph [0100]) is a reference to a type of laser:

"As for a waveguide type, an index guided type semiconductor laser is desirable ... ."

This fails to suggest using, "an optical waveguide positioned in front of the lamp."  
Instead this appears to describe the laser, and therefore does not also describe:

"... said optical waveguide having a configuration that alters a light path passing through at least one end of the optical waveguide and provides a uniform intensity of light ..."

and

"... illuminating the sample with a uniform light intensity distribution as provided by the uniform intensity of light from the optical waveguide, the optical waveguide reducing of the difference in light intensity between the center and the edges of the tube plate ... ."

The Final Office Action suggests that it would have been obvious to use an optical waveguide in the system of AAPA, as taught by *Mawatari*; however, the optical waveguide as taught by *Mawatari* is not placed between the light source and the sample.

Further, the Final Office Action indicates a desirable feature of having a wavelength nearer to an infrared region; however, this contradicts Applicants' use of an infrared filter on the illumination side of the sample:

"... an infra-red cutting filter filtering light transmitted ... said infra-red cutting filter cutting infra-red from the lamp ..." (Claims 1 and 19.)

Since Applicants' monitoring apparatus is implemented with fluorescence, having a transmitted wavelength nearer to an infrared region would require an even longer wavelength receiving component, placing reception even further into the infrared range.

*Olshansky* is cited as teaching an index guided semiconductor laser with a faceted waveguide. The Final Office Action deemed it obvious to substitute one known index guided semiconductor laser for another index guided semiconductor laser in the monitoring apparatus.

As with the *Mawatari* reference, it is respectfully submitted that this fails to suggest using, "an optical waveguide positioned in front of the lamp." Instead it asserts an allegedly obvious substitution of the lamp, describing features of the lamp which are neither claimed nor described by Applicants.

Applicants therefore respectfully submit that the *Applicants' admitted prior art* and *Mawatari* and *Olshansky* references do not teach or suggest all the features as recited in claims 1 and 19. It is therefore respectfully submitted that the rejection under 35 U.S.C. §103(a) should be withdrawn.

Applicants respectfully request that the Examiner withdraw the rejections and that the case be passed to issuance.

**Claims 2 5, 12 and 17**

Claims 2-5, 12 and 17 are written in dependent form and depend from claim 1. Those dependent claims should be allowable for at least the same reasons that claim 1 is allowable.

In addition, claim 4 describes minimizing the loss of the light emitted from the light irradiation source by irradiating the light transmitted through the light path in a rectangular light beam adjusted to an aspect ratio of the reaction tube plate using the optical waveguide. It is submitted that this feature further distinguishes the Applicants' subject matter from the prior art of record.

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### **CONCLUSION**

In light of the previous amendment, Applicants submit that the application is in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner call the undersigned.

Respectfully submitted,  
**THE NATH LAW GROUP**

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THE NATH LAW GROUP  
112 South West Street  
Alexandria, VA 22314-2891  
Tel: 703-548-6284  
Fax: 703-683-8396

/Stan Protigal/  
Jerald L. Meyer  
Registration No. 41,194  
Stanley N. Protigal  
Registration No. 28,657  
Customer No. 20529